Solutions for Demanding Applications

VarTech Systems Inc.

Industrial CRT and Flat Panel Displays

VT084 DiamondVue Series

8.4” Flat Panel Series LCD Monitors

Model Numbers:

VT084C · VT084P · VT084PSS · VT084W

VT084CXGA · VT084PXGA · VT084WXGA

VT084P3 · VT084RDD

User’s Guide

Read these instructions completely before attempting to operate your new Color Display.

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Section

1

INTRODUCTION

1.1 About LCD Monitors

What you gain by using an LCD monitor in your industrial controls

LCDs are the future of display technology. Although CRTS have dropped in cost significantly, they do not offer the performance, reliability, and mounting options available with LCDs. LCD monitors consist primarily of an LCD, Video Board and a Back Light video. The LCD determines to a large extent the viewing angle, brightness and contrast. Beyond that it is function of the video board which converts the analog RGB (Red, Green, Blue) signals from a standard video card to a high quality, digital RGB that the LCD can display.

Recently the video card has taken on a new role. It is the responsibility of this device to "scale" a particular video resolution to the "native" resolution of the LCD. Simply, consider that a computer is putting out a VGA [640x480] resolution signal, yet the LCD that is connected is an XGA [1024x768] display. The displayed picture would be in the center 1/3 of the LCD. With the introduction of the scaling engine. The converter will mathematically recalculate the 640x480 to 1024x768. This may sound simple but it is in fact a complex algorithm that adjusts for different aspect ratios and pixel alignment, essentially smoothing text and graphics to produce a picture that is pleasant to the eye.

All Vartech displays from 12.1" (800x600) to 23.1 (1600x1200) incorporate scaling engines in the converter card.

1.2 Product Safety Precautions

- ⇒ Ensure that sufficient space is available around the display to provide the circulation necessary for cooling.
- ⇒ Ensure that the ambient air temperature will not exceed the specified maximum temperature.
- ⇒ Do not attempt to service this display yourself. The rear chassis has a seal so that non qualified personal will not expose themselves to dangerous voltages or other risks.
- ⇒ To protect from electrical shock, unplug the display power supply from the wall before moving.
- ⇒ Do not expose the display to direct sunlight or heat.
- ⇒ Do not use this display near water
- ⇒ Do not place any heavy objects on the power cords. Damage may cause electrical shock.
- ⇒ Unplug the power supply from the wall or unit if one of the following conditions exists.
    - ⇒ Power cord or plug is damaged or frayed.
    - ⇒ Liquid is spilled into the display or the display is exposed to rain or water.
    - ⇒ The display does not operate normally when the operating instructions are followed.
    - ⇒ The display has been dropped or the enclosure has been damaged.
    - ⇒ The display exhibits a distinct change in performance, indicating a need for service.

Section

2

DISPLAY SETUP

2.1 VT084 Series Display Features

⇒ The VT084 is capable of displaying 256K colors in a continuous spectrum. The high contrast LCD enhances the image with no geometric distortion.

⇒ The VT084 Series directly accepts an analog 5 wire RGB with separate H/V.

⇒ The VT084 Series is set to VGA 640 x 480.

⇒ The VT084 Series is available in Panel Mount, Chassis Mount or Wall Mount industrial packages.

⇒ The VT084 Series is supplied with a Anti-Reflective Screen unless equipped with an optional Touch System.

⇒ The VT084 Series has a +12V DC jack. Vartech provides an optional 115/220VAC “Brick” supply.

2.2 Unpacking and setting up your display

Your LCD monitor package will consist of the components listed below. Open shipping container and lay all components on a flat clean surface.

2.3 What is included with your display

- ⇒ VT084P, VT084C, VT084W LCD Monitor
- ⇒ 5 ft Video Cable.
- ⇒ +12VDC power connection. (115/220VAC "Brick" Power Supply is optional)
- ⇒ 10-32 Mounting Hardware. (For use with Panel Mount only)
- ⇒ 6 ft RS232 Touch Interface Cable (Optional when touch is installed)
- ⇒ CD ROM with Touch Screen Drivers (Optional when touch is installed)
- ⇒ Users Manual

2.4 Connecting the Display

1. Connect all cables to the computer first. This would include the VGA cable and the optional RS 232 serial touch screen connection.
2. After connecting the cables between the LCD monitor and the computer, plug the customer supplied +12VDC source to the 12V connection on the rear or the 12VDC connection from the output of the optional 115/220VAC supply.
3. Once the +12V or the 115/220VAC connection is made, the display is active.
4. If your computer was off, turn on your computer.
5. Your display should now operate as a normal computer display showing your windows or whatever video is being sent to the flat panel.

Note: If for any reason the display goes blank and gives an "out of Range" or "No Input Signal", your computer or video source is putting out a signal that is out of range of the LCD's video board. If this happens, reboot the computer or video source and make sure you are inputting the correct signal. If the display doesn't work properly, it may be because:

(a) The resolution is to high or low for the LCD.

(b) The refresh rate is set to high. Refresh on an LCD is different than a CRT. Set the refresh to 60Hz. CRT's need a high refresh rate to avoid flicker. The refresh rate has no impact on LCD's.

(c) The power source is incorrect.

(d) The unit is malfunctioning. If you believe this to be true, disconnect the video cable from the rear of the LCD and connect to a known good computer CRT display. If the computer display is working satisfactory and the video is within the appropriate range, then contact Vartech Customer service for a RMA number at 800-223-8050.

2.5 Signal Connections

To avoid irregular operation and /or damage to the display, please insure correct video is being supplied as shown on the following page.

2.6 Signal Connections Cont.

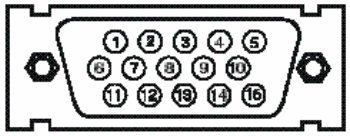
You can use an HD-15 connector cable or a BNC adapter cable to connect the flat panel monitor to the host computer. The HD-15 video cable (supplied in the kit) you use with this monitor is equipped with a conventional HD-15 connector at each end.

Note: The following figure is the view looking into the pin end of the male connector or solder term end of the female connector.

HD-15 Video Connector

The following table provides the pin numbers and corresponding pin assignments for the HD-15 video connector.

Pin assignments for the HD15 video connector			
Pin	**Connection**	**Pin**	**Connection**
1	Red Video	9	No Connection
2	Green Video	10	Sync Ground
3	Blue Video	11	No Connection
4	No Connection	12	Bi-Directional Data
5	Return	13	Horizontal Sync
6	Red Video Ground	14	Vertical Sync
7	Green Video Ground	15	DDC Clock
8	Blue Video Ground		



HD15 Connector

Pin assignment for 9 Pin Optional Touch Screen Connector.		
Pin		
1	DCD	Data Carrier Detect
2	RD (Rx)	Receive Data
3	SD (Tx)	Transmit Data
4	DTR	Data Terminal Ready
5	SB	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	NC	No Connection

2.5 Signal Connections Cont.

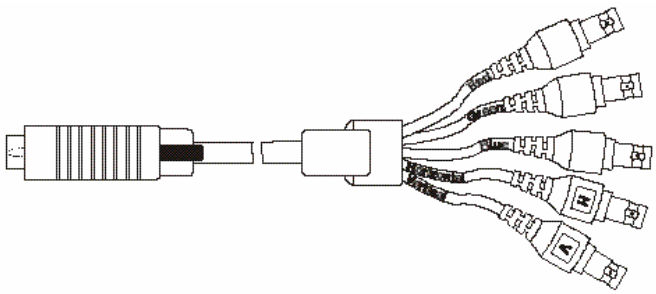
Optional BNC Adaptor Cable

A 5-BNC-to-HD-15 adapter cable is available. The functions of the cables are described below.

⇒ **R**, **B**, and **G**: Red, Green, and Blue input connectors to establish color. These are used for RS-343 analog signals.

⇒ **HS/CS**: Separate horizontal/composite sync signal from the video source.

⇒ **VS**: Separate vertical sync signal from the video source.



BNC Adapter Cable

This table describes the signal types you can use with the connectors:

BNC Signal Type	Description	R	G	B	HS/ CS	VS
Sync-on-Green (optional)	Use the three video connectors. Horizontal and vertical syncs are supplied on the green video line.	X	X	X		
Composite Sync	Use the three video connectors plus the horizontal sync/ composite sync input.	X	X	X	X	
Separate Horizontal and Vertical Sync.	Use the three video connectors plus the horizontal sync/ composite sync and vertical sync input.	X	X	X	X	X

Section

3

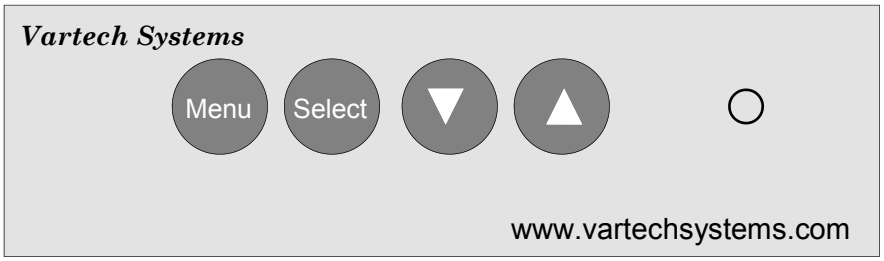
GETTING STARTED

3.1 Adjusting the display

The VT084 Series display has an embedded microprocessor in the converter card. Once you have the unit to display VGA do the following:

In order to navigate to the appropriate adjustments, press **Menu** and the OSD layout chart will appear as indicated in Fig. 1 from left to right.

If you press the "MENU" the new settings are saved and the OSM appear and your setting will be stored in the unit's non volatile memory.



3.2 Definition of OSD (on screen display) Adjustments

OSD Layout	
There are four membrane buttons (as shown above) located on the rear of the unit. They will activate the OSD and allow navigation to all adjustments if your unit requires adjustment.	
Main Menu	Sub Adjustment
Automatic Adjust	Geometry & Color Balance
Horizontal Position	Horizontal position
Vertical Position	Vertical Position
Horizontal Size	Horizontal Size
Phase	Phase
Brightness	Brightness
Contrast	Contrast
Color	Red, Green, Blue
OSD Language	English, Espanol, Deutsch, Francais, Italiano
Advanced	Factory Preset, OSD Hor. Pos., OSD Vert. Pos.
Cancel	

Fig. 1

3.3 Adjustment Procedure

OSD Display Menu	
Automatic Adjustment	Press **Menu** and the automatic adjustment will be the first item to appear on the OSD. Hit **Select** and then press the **Up/Down** button to navigate to Geometry. Press **Select** again and the display will automatically adjust the geometry. Press the **Up/Down** button to **Color Balance.** Hit **Select** again and the display will automatically preset the color balance to a factory preset value.
Horizontal Position	Press **Menu**. Press the **Up** button to the second icon which is **Horz. Pos** Hit **Select** and then press the **Up/Down** button to achieve the desired position. The desired value will be graphically illustrated along with a digital value. When complete press **Select** and you are ready to move to the next adjustment.
Vertical Position	Press **Menu**. Press the **Up** button to the third icon which is **Vertical Position.** Hit **Select** and then press the **Up/Down** button to achieve the desired position. The desired value will be graphically illustrated along with a digital value. When complete press **Select** and you are ready to move to the next adjustment.
Horizontal Size	Press **Menu**. Press the **Up** button to the fourth icon which is **Horizontal Size.** Hit **Select** and then press the **Up/Down** button to achieve the desired size. The desired value will be graphically illustrated along with a digital value. When complete press **Select** and you are ready to move to the next adjustment.
Phase	Press **Menu**. Press the **Up** button to the fifth icon which is **Phase.** Hit **Select** and then press the **Up/Down** button to achieve the desired phase. The phase should be adjusted until the screen image is sharp and there is no When complete press **Select** and you are ready to move to the next adjustment.
Brightness	Press **Menu**. Press the **Up** button to the sixth icon which is **Brightness.** Hit **Select** and then press the **Up/Down** button to achieve the desired brightness level. The desired value will be graphically illustrated along with a digital value. When complete press **Select** and you are ready to move to the next adjustment.
Contrast	Press **Menu**. Press the **Up** button to the seventh icon which is **Contrast.** Hit **Select** and then press the **Up/Down** button to achieve the desired contrast level. The desired value will be graphically illustrated along with a digital value. When complete press **Select** and you are ready to move to the next adjustment.

3.3 Adjustment Procedure Cont.

OSD Display Menu		
Color	Color temperature adjustments allows the user to adjust for desired white balance. This can be achieved by adjusting the **Color Temperature** control or adjusting the individual **Red, Green or Blue** controls. Press **Menu**. Press the **Up** button to the eight icon which is **Color .** Hit **Select** and then press the **Up/Down** button to select the **Color Temperature**. Hit **Select** again and adjust the **Up/Down** button and adjust to one of the desired six digital values. The six digital values are graphically illustrated. When complete press **Select** and you are ready to move to the next adjustment. If your require a unique white balance, you can adjust the individual colors to achieve this value by proceeding with the following adjustments.	
	Red	Press **Menu**. Press the **Up** button to the eight icon which is **Color.** Hit **Select** and then press the **Up/Down** button to select **Red**. Hit **Select** again and adjust the red value which is graphically illustrated along with a digital value. When complete press **Select** and you are ready to move to the next adjustment.
	Blue	Press **Menu**. Press the **Up** button to the eight icon which is **Color.** Hit **Select** and then press the **Up/Down** button to select **Blue**. Hit **Select** again and adjust the blue value which is graphically illustrated along with a digital value. When complete press **Select** and you are ready to move to the next adjustment.
	Green	Press **Menu**. Press the **Up** button to the eight icon which is **Color.** Hit **Select** and then press the **Up/Down** button to select **Green**. Hit **Select** again and adjust the green value which is graphically illustrated along with a digital value. When complete press **Select** and you are ready to move to the next adjustment.
OSD Language	This function allows you to convert from English to the following languages. Espanol, Deutsch, Francais, Italiano. If you desire one of these languages, proceed to adjust as follows. Espanol will be used as an example.	
Espanol	Press **Menu**. Press the **Up** button to the ninth icon which is **OSD Language.** Hit **Select** and then press the **Up/Down** button to select **Espanol**. Hit **Select** again and the display will convert all text to Espanol. When complete press **Select** and you are ready to move to the next adjustment	

3.3 Adjustment Procedure Cont.

OSD Display Menu	
Advanced	The advanced control allows for several advanced adjustments. Factory Preset Sharpness OSD Horz. Pos OSD Vert. Pos
Factory Preset	The Vartech display has a number of standard settings installed at the factory for your convenience. If you make a number of adjustments and then want to default to the standard settings, proceed as follows. Press **Menu**. Press the **Up** button to the ninth icon which is **Advanced.** Hit **Select** and then press the **Up/Down** button to select **Factory Preset**. Hit **Select** again and the display will default to all original factory adjustments. When complete press **Select** and you are ready to move to the next adjustment.
Sharpness	Press **Menu**. Press the **Up** button to the eight icon which is **Advanced.** Hit **Select** and then press the **Up/Down** button to select **Sharpness**. Hit **Select** again and adjust the sharpness value which is graphically illustrated along with a digital value. When complete press **Select** and you are ready to move to the next adjustment. If you desire to adjust the OSD display off center to another location, proceed to adjust the horizontal and vertical position as outlined
OSD Horz. Pos.	Press **Menu**. Press the **Up** button to the ninth icon which is **Advanced.** Hit **Select** and then press the **Up/Down** button to select **OSD Horz. Pos**. Hit **Select** again and adjust the horizontal position of the OSD to your desired location. When complete press **Select** and you are ready to move to the next adjustment.
OSD Vert. Pos.	Press **Menu**. Press the **Up** button to the ninth icon which is **Advanced.** Hit **Select** and then press the **Up/Down** button to select **OSD Vert Pos**. Hit **Select** again and adjust the vertical position of the OSD to your desired location. When complete press **Select** and you are ready to move to the next adjustment.
Cancel	This control allows the cancellation of any values previously entered. Press **Menu**. Press the **Up** button to **Cancel.** Hit **Select** and all entries will be canceled.

Section

4

TOUCH SCREEN

4.1 Introduction

Touch screens are a common means to interface operator inputs to a system. The universal standard of Windows GUI (Graphical User Interface) has significantly increased the use of touch screens.

There are four main touch technologies. The technologies are resistive, surface acoustic wave (SAW), capacitive, and infrared (IR). Each touch technology has advantages and disadvantages based on different user applications.

4.2 Installation

All Vartech Systems displays configured with a touch screen are supplied with a CDROM which includes user manuals, application software, and drivers for various operating systems. Insert the supplied CDROM into a CDROM drive and follow the installation instructions that will appear on the screen.

Limited technical support is available by contacting Vartech Systems customer support at 800-223-8050.

Troubleshooting	
Trouble	**Troubleshooting Tip**
No Picture	• The signal cable should be properly connected to the display card and computer. • Try disconnecting the video cable from the display and connecting to a CRT display if available to confirm the presence of proper video. • Make sure power is connected to the proper DC or AC source. • Make sure the resolution mode is supported by the display and check settings of the display card. • Confirm that the video cable is not defective.
Image Persistence	Image persistence occurs when a ghost of an image remains on the screen after the monitor has been turned off. Unlike a CRT monitor, an LCD monitor's image persistence is not permanent. To erase an image ghost, turn the monitor off for as long as the image was displayed. If the image was on for one hour and the ghost of the image remains, the display should be turned off for one hour to erase the image. To avoid this problem, use a screen saver.
Picture Quality & Image Stability	• Check for proper video cable for proper grounding and shielding. • Check the signal source for proper signal. • Check for proper adjustment of the Phase and Frequency controls. • Check for proper recommended signal timing.
Display image is not properly sized	• Adjust the Vertical and Horizontal size controls via the OSD. (Reference setup adjustments) • Ensure that a supported mode is selected on the display card or system being used. Consult the display card or system manual for proper video.
No S-Video or NTSC operation	• Check for proper connections. • Check the setup instructions for proper input selection.
If these tips do not solve your problem, contact VarTech Systems Customer Service support.	

Troubleshooting Cont.

Trouble	Troubleshooting Tip
Screen is blank.	• Screen saver activated. • Video Cable problem. Check for proper installation • Change video cable • Faulty video display. Needs Service
Image is dim, even with brightness and contrast controls set full UP.	• Video cable problem. • Check for proper installation of cables • Faulty video source • Faulty display
Image not centered	Reset the horizontal and vertical positioning using the on-screen menu. Check to see if video source is operating within the monitor's range.
Image will not adjust	Video timing outside of range. Use the on-screen menu to ad just the Clock Setting. Make sure timing is within VESA standard.
Image is not stable.	Monitor has incorrect or bad sync signals. Check for proper video cable installation. Replace suspected faulty cable. Check to ensure that video source is operating within the display's range.
Vertical shaded bars on screen image	Horizontal size not properly adjusted. Adjust horizontal size settings.
Colors are missing	• Faulty video cable. • Missing from video source. Connect video source to another display.
Screen jitter or noisy display	• Monitor clock phase not properly adjusted. • Video cable problem • External noise interference.
Slight distortion in text or Graphics.	Not working in native resolution.
Display is present but "bars" appear or roll across screen	Ground loop problem between computer and display Interference from adjacent equipment.
The background looks acceptable but text and icons seem to be missing rows of pixels	Video running interlace mode.

Section

6

CLEANING AND MAINTENANCE

Cleaning
Occasionally clean the display panel and cabinet with a soft cloth dampened (not soaked) with a mild (non-abrasive) glass cleaner. Keep turning a fresh side of the cloth toward the screen surface to avoid scratching it with accumulated grit.

Note: The solvent should be applied only to the cloth, and not directly on the monitor screen.

Do not use paper products as they may scratch the surface. To minimize the risk of abrasion, allow the screen to stand dry.
Special care should be taken when cleaning a touch screen or polycarbonate shield that is installed over the screen. Abrasive and certain chemical cleaners can easily damage the surface.

Note: For best results cleaning a monitor with the optional antireflective tempered glass display shield, a solution of denatured alcohol is recommended to thoroughly clean the display.

Never use alcoholic or ammoniac cleaners to clean the polycarbonate shield or a touch screen.

Replacing a Line Cord
To avoid shock and fire hazards, the monitor's power cord should be replaced if the insulation becomes broken or if it develops a loose internal connection.

Other Maintenance
Qualified service personnel should perform all maintenance, except for the power cord replacement described above.

Section

7

MECHANICAL DRAWINGS

Mechanical Drawings		
Model	**Description**	**Page**
VT084C	8.4” Chassis Mount Mechanical Drawing	16
VT084P	8.4” Panel Mount Mechanical Drawing	17
VT084W	8.4” Wall Mount Mechanical Drawing	18
VT084RDD	8.4” Dual Rack Mount Mechanical Drawing	19

7.1 Chassis Mount Procedure

Mounting instructions for chassis mount

The chassis mount contains a simple frame with mounting holes. Traditionally captive hardware would be used to secure the display against a panel with the proper hole size based on the mechanical drawing. The chassis display is supplied with a piece of Plexiglas material sealed to the front for protection. If the display is equipped with a touch screen, the touch screen takes the place of the Plexiglas for protection of the LCD.

The unit is normally supplied for +12V operation, however it is available with a 115/220VAC supply.

7.2 Panel Mount Procedure

Panel Mounting Procedure

1. Cut and drill the panel (refer to panel mount drawing). Measurements are in inches.

Panel Mounting Cutout

2. If access to the side of the monitor is not available following installation, attach the power and video cables to the side of the monitor at this time.
3. Install the monitor in the prepared cutout.
4. Install the lock nuts and washers, supplied with the monitor, behind the holes running along the sides and top/bottom of the cutout in the panel. Extra lock nuts and washers are provided.

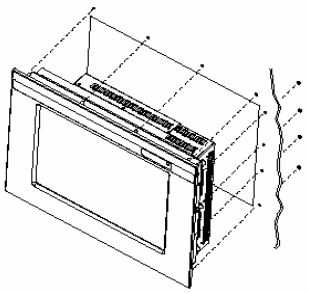
Note: Use #10-32 nuts for mounting.

5. Tighten all mounting nuts evenly to a torque of 24 inch-pounds.

ATTENTION: Mounting nuts must be tightened to a torque of 24 inch-pounds to provide panel seal and avoid potential damage. Vartech Systems assumes no responsibility for water or chemical damage to the monitor or other equipment within the enclosure due to improper installation.

6. Attach the power and video cables to the side of the monitor if you have not already done so.

Generic Panel Mount Diagram



Section

8

SPECIFICATIONS

ENGINEERING SPECIFICATIONS	
Panel Size	8.4”
Type	Active Matrix Color Thin Film Transistor (TFT)
Resolution Capabilities	VGA
Pixel Pitch	0.297mm
Active Display Area:	6.7” x 5.1” / 170mm x 130mm
Pixel Format	**VT084C, VT084P, VT084PSS, VT084W** 640 x 480 **VT084CXGA, VT084PXGA, VT084WXGA** 640 x 480, 800 x 600, 1024 x 768
Viewing Angle (Left/Right)	65/65º
Viewing Angle (Up/Down)	60/50º
Contrast Ratio	450:1
Brightness	400 Nits
Response Time	45ms typical
Back Lights	Cold Cathode 50,000 Hrs. Half Life
Video Connector	HD15(F); RCA (NTSC/PAL) and 5 Pin Mini Din (S-Video
Colors Supported	256K
Video Input	Analog 0.7 Vp-p NTSC/PAL
Sync	Separate H&V, Combined, SOG (Sync On Green)
Input Voltage	+12VDC
Power consumption	Normal: 25Watts
Operating Temperature	0 to 50ºC
Storage Temperature	-20 to 60ºC
Operating Humidity	10 to 95%NC
Storage Humidity	10 to 95%NC
Operating Altitude	Up to 10,000 ft
Storage Altitude	Up to 40,000 ft

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